

# Empirical Testing of the Mediating Effect of Absorptive Capacity and Moderation of Cultural Intelligence on Intellectual Capital and Innovation Analysis on the Tourism Industry

Wisnu Yuwono\*  
Universitas Internasional Batam  
Batam, Indonesia  
\*wisnu@uib.ac.id

Dadan Umar Daihani, Willy Arafah  
Universitas Trisakti  
Jakarta, Indonesia

**Abstract**—The research aims to analyze the innovation trigger factor in the tourism industry sector. The research about innovation in the tourism industry rarely found until nowadays. The researcher tries to analyze the effect of intellectual capital to innovation, intellectual capital to potential absorptive capacity (PACAP), the effect of intellectual capital to realized absorptive capacity (RACAP), The effect of PACAP to innovation with moderated by the cultural intelligence, and the effect of RACAP to innovation with moderated by the cultural intelligence. The research used primary data with 54 respondents, CEO (Chief Executive Officer) that manage tourism travel in Batam City. Through the analysis of Structural Equation Model (SEM) with SmartPLS version 3.0 software, can be resulted, there are: 1) Intellectual Capital doesn't affect directly to the innovation, but it must use RACAP; 2) Intellectual capital affect to PACAP and RACAP; and 3) the variable of cultural intelligence only has role as predictor variable in moderate the relation PACAP and RACAP to innovation. The result of this research will use as a reference for the tourism managers in developing their business.

**Keywords**—*intellectual capital, innovation, Potential absorptive capacity (PACAP), Realized absorptive capacity (RACAP), cultural intelligence*

## I. INTRODUCTION

The tourism sector has been riveting the attention of the economist in the whole world. This sector has grown and contributed positively to the hundreds of employees and move the other economic sector, such as manufacture, transportation sector, and information sector. In the Southeast area, tourism gives good potency because of the development of foreign visits of more than 10 %. But, Indonesia in the third grade among those ASEAN countries in foreign tourism visits. Besides, the Indonesian position is still the fifth for the development of the number of foreign tourist visits [1]. The superior human resource pillar and have quality is the main key to develop the tourism industry in Indonesia, as Human Resources support innovation in business development. No

wonder the tourism sector doesn't develop well because of the gradual decrease from 42 to 64 from 136 countries [2]. The quality of Human Resources is the main priority [3,4].

The development of the tourism sector needs innovation from the development of knowledge (absorptive capacity) in the innovation of the new product, in novelty development in radical innovation or disruptive in product developing innovation that already exists [5]. But absorptive capacity is affected by intellectual capital. Some of the researches about the intellectual capital to absorptive capacity show different results like [6]. The research shows that the intellectual capital with the variable of human capital, social capital, organizational capital to absorptive capacity divided to two variables, there are potential absorptive capacity (PACAP), with the dimension of acquisition and assimilation; and the variable of realized absorptive capacity (RACAP) with the dimension of transformation and exploitation, where the result shows the significant effect, except for social capital, but according to Nazarpouri; Cassol, Gonçalo, and Ruas [7,8], conclude that the three intellectual capital variables have significant effect. PACAP and RACAP push innovation [7,9,10], according to Leal-Rodríguez et al. [5], PACAP doesn't support innovation because of the skill difference from the team.

Batam City is one of the city in Indonesia that is famous as MICE City (meeting, incentive, convention, exhibition), that often holds a national and international event and has the geographic superior because it closes to the other country, those are Singapura and Malaysia. It is also supported due to Batam as the third open gate of foreign tourists in visiting Indonesia. But, the developing of foreign tourist after 2014 show a slower symptom than before 2014 [11]. On the other side, the hotel occupancy still on average in 2017 [12].

Some of the research above shows different results, so it is very interesting to research, moreover for Batam City, that has multi-ethnic society structure, that usually practices the cultural

intelligence element [13], so the cultural intelligence factor can be a capital to strengthen the relationship between absorptive capacity to innovation. Due to this thing above, so the problem that will analyze in this research is empirical testing of the mediating effect of absorptive capacity and moderation of cultural intelligence on absorptive capacity and innovation analysis on the Batam City tourism industry, so the problem that will analyze in this research are: (1). Is the intellectual capital effect on the innovation, potential absorptive capacity, and realized absorptive capacity? (2). Is the potential absorptive capacity effect to realized absorptive capacity and innovation? (3). Is the realized absorptive capacity an effect on innovation? and (4). Are the potential absorptive capacity and potential realized capacity effect to innovation, moderated by the cultural intelligence?

Innovation is the implementation from ideas, process, product or new service [14]. Innovation variable can be measured to be six things, those are product development frequency or new service, responsive feedback to the needs of customer, the development of company work, new service implementation, new technology and new method [15]. Intellectual capital consists of three dimensions. Those are human capital, social capital and structure capital, which the unformed asset and becoming the basic for the company to support innovation [6-8]. Absorptive capacity defined as the competency of employee and motivation to support to get external knowledge and the want to use those knowledge for the innovation company [7]. Absorptive capacity divided into two variable, those are potential absorptive capacity (PACAP), with the dimension of acquisition and assimilation; and the variable of realized absorptive capacity (RACAP) with the dimension of transformation and exploitation [6,16]. The cultural intelligence is the dynamic competency to avoid the cultural differences that inhibit exploration and transfer of knowledge in organization to improve innovation [17,18].

The intellectual is knowledge to build skills in the process of innovation development company [19] and to push new standards [6]. Besides that, the intellectual capital creates the organization structure in improving the relationship among the employee and push the innovation repairmen [20,21].

Intellectual capital consists of three-dimension; those are human capital, social capital, and structural capital. The employee knowledge creates (novelty ideas) called PACAP [7]. The aspects of human capital will push PACAP because it pushes the employee skill in operational activity [6,22]. Social capital with good interaction from various knowledge background will push PACAP [7], this thing will push PACAP when the management create participation management system [10]. Structure capital pushes the formal process in the organization [6], and the intensive that issued by the company will have a significant effect on PACAP [8].

The employee knowledge will create the new ideas that are useful and can take benefit directly for company, called realized absorptive capacity [6,7], so the interaction relation and collaboration will push the employee trust in implementing

knowledge that is useful for company [23], and the good organization resource utensil make the aim of the company can be reached better [6,7].

PACAP was formed by knowledge, so the next step is pushing the knowledge to become useful knowledge and can be implemented or often called RACAP, so PACAP affects directly to RACAP [24] and the organization member improve new view that is relevant to the aim of the organization [25]. PACAP will be more effective in improving RACAP if PACAP will distribute in every part of the organization [26].

Every component of absorptive capacity (PACAP and RACAP) will affect innovation [25]. PACAP affect innovation directly through feeling and the creative external organization election [18]. PACAP is made together with the element or the other organization capability, that mat is for innovating without the transformation effort and explicit and significant exploitation, so PACAP affects directly to the innovation [27]. PACAP will push innovation and depends on strong team capability [5].

RACAP is an important step to push innovation through implementing new knowledge [7,9]. RACAP push innovation through the collaboration among the employee [10], and directly because it can be directly alerted to be innovation input [18].

The cultural intelligence variable has a role as the moderate variable in interpreting PACAP, and RACAP to be innovation has a cognitive capability that connects to absorption and higher knowledge learning and assimilation for innovation [17,18,28].

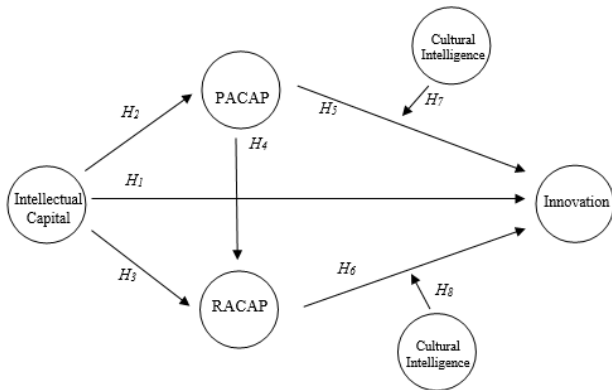
Refer to the discussion above, so the new and the research model is on table 1:

TABLE I. THE NEW RESEARCH

Variable	Intellectual Capital	PACAP	RACAP	Cultural Intelligence	Innovation
[6]	v	v	v		v
[7]	v	v	v		v
[8]	v	v	v		
[29]	v	v	v		
[16]	v	v	v		
[9]		v	v		
[10]	v	v	v		v
[5]		v	v		
[18]		v	v	v	v
Researcher	v	v	v	v	v

Source: a review of related literature, 2019.

The conceptual framework that made, and shown by the figure 1 below:



Source: Related of literature review, 2019.

Fig. 1. Research model.

II. METHODS

This research is the basic research with survey technique to test the hypothesis from the effect of intellectual capital (with the dimension of human capital, social capital and structure capital) to the innovation and absorptive capacity (with the dimension PACAP and RACAP), and the effect of absorptive capacity to innovation by moderated cultural intelligence. The event of the research was held in the tourism sector that listed in ASITA (Association of The Indonesian Tours and Travel Agencies) DPD (Regional Representative Council) Batam City, Riau Islands Province, consists of 70 companies. The sample of the research is the manager of tourism travel agent company in Batam City and take the sample with purposive sampling technique, the criteria are the listed company in ASITA DPD Batam City with the time of operation minimal three years and have been running the business until now.

All of the research variables were measured using a Likert scale (five Likert scales), from 1 (strongly disagree) to 5 (strongly agree) for each indicator/statement item. Measurement of innovation in this study refers to four dimensions, namely, marketing innovation, product innovation, process innovation, and organizational innovation [8]. On the other side, the intellectual capital variable consists of three dimensions, namely human capital, social capital, and structural capital, whose measurements refer to Engelman et al. [6] and Costa et al. [30]. PACAP consists of the dimensions of acquisition and assimilation, RACAP consists of the dimensions of transformation and exploitation [6], and the dimensions of the cultural intelligence variable are metacognitive intelligence, cognitive, motivation, and behavior [17,18]. The data analysis technique is partial least square (PLS) with SmartPLS software version 3.0. Some data analysis techniques used are an evaluation of measurement model measurements, which consist of convergent validity, discriminant validity, reliability test. Then proceed with a structural model evaluation, which consists of hypothesis testing.

III. RESULTS AND DISCUSSION

A. Results

In the first stage in data analysis, a convergent validity test is performing on all indicators, where the value of the loading factor must be more than 0.70, and indicators that do not meet must be eliminated or excluded from the model [31]. In general, this procedure has been carried out and meets the requirements. In addition to using the factor loading approach in determining convergent validity and Average Variance Extracted (AVE) assessment test was used. The result is the AVE value of all variables/dimensions is above 0.50, which means it meets the requirements. Whereas discriminant validity was done by using cross-loading values where values of more than 0.70 are generating for each variable, which means it also meets the discriminant validity requirements [31]. For reliability testing with Cronbach's alpha technique and composite reliability is above 0.70, so it can conclude that the construct that built proved to be reliable. The table 2 following are the results of testing the hypothesis:

TABLE II. THE RESULTS OF TESTING THE HYPOTHESIS

Hypothesis:	Description	T-Statistic	P-Value	Conclusion
1	Intellectual capital affects positive significance to innovation	1,537	0,125	Rejected
2	Intellectual capital affects positive significance to potential absorptive capacity.	14,040	0,000	Accepted
3	Intellectual capital affects positive significant to realized absorptive capacity.	5,386	0,000	Accepted
4	Potential absorptive capacity affects positive significance realized absorptive capacity	0,614	0,539	Rejected
5	Potential absorptive capacity affects positive significance to innovation	0,799	0,425	Rejected
6	Realized absorptive capacity affects positive significance to innovation	2,095	0,037	Accepted
7	The higher the level of cultural intelligence, the stronger the connection of potential absorptive capacity with the innovation.	0,103	0,918	Rejected
8	The higher the level of cultural intelligence, the stronger the connection of realized absorptive capacity with the innovation.	0,131	0,896	Rejected

Source: primary data processed, 2019.

B. Discussion

The intellectual capital variable does not directly influence innovation (H<sub>1</sub>). It is consistent with the research of [32], which concludes that there is still a lack of direct contribution of intellectual capital to corporate innovation due to

environmental factors. Variable intellectual capital directly affects the potential absorptive capacity (H<sub>2</sub>) and realized absorptive capacity (H<sub>3</sub>). The results of this study support research [7,8], where the level of skills and education levels of employees and CEOs are relatively high, so they are skilled in solving the problem. Furthermore, according to this condition is also related to a minimalist organizational structure [7,8]. If you look at the average number of employees in a travel service company with an average number of employees, that is indeed the condition of their limited organizational structure.

The potential absorptive capacity variable does not significantly influence the realized absorptive capacity (H<sub>4</sub>), this condition shows that when employees get new knowledge, this has not been able to encourage the implementation of that knowledge into useful knowledge. This condition is limited found in the results of previous studies. The potential absorptive capacity variable does not significantly influence innovation (H<sub>5</sub>). Potential absorptive capacity is going to encourage innovation [10,25,33], but in this study, it turns out that there is no proven possibility because of the lack of strength of this variable where the average value is the lowest among other variables.

The RACAP variable directly influences the innovation variable (H<sub>6</sub>). The results of this study support research [9,18,25,27], where companies have succeeded in developing old knowledge and new knowledge to produce innovative products. The cultural intelligence variable does not significantly moderate the relationship between PACAP (H<sub>7</sub>) and RACAP (H<sub>8</sub>) on innovation. But on the other hand based on the test results that the cultural intelligence variable has a significant direct effect on the innovation variable, so the form of the relationship as in this model is called the predictor moderation, meaning that the cultural intelligence variable only acts as an independent variable in the relationship model that is forming. One of the new findings in this study is that RACAP mediates the relationship between intellectual capital and innovation as in the following table 3:

TABLE III. ANALYSIS OF IC-RACAP-INNOVATION INDIRECT RELATIONS

Variable	Relationship	Beta score	T score	P-Value	Conclusion
IC → Innovation	Direct	0,149	1,537	0,125	Rejected
IC → RACAP → Innovation	Indirect	0,702 x 0,339 = 0,238	2,006	0,045	Accepted

Source: Primary data processed, 2019.

**IV. CONCLUSION**

Based on the above research, it appears that to increase the innovation, companies' intellectual capital cannot directly towards innovation, but must go through realized absorptive capacity as an intervening variable. The most influential intellectual capital is human capital, then social capital and

structural capital. Some of the recommended ways to travel service business managers are to improve training or take part in certification carried out by the National Professional Certification Board (BNSP), regular meetings to gather new knowledge and implement it into useful knowledge and still maintain a minimalist organizational structure but need attention also the addition of a special division of research and development departments. The next researcher is expecting to be able to complete this research in particular to explore dominant logic [34] and others such as innovation strategy and policy [35].

**REFERENCES**

- [1] ASEAN, "Tourist Arrivals in ASEAN," 2017.
- [2] WEF, "The Travel & Tourism Competitiveness Report 2017," 2017.
- [3] S.L. Ratnasari, "Aktualisasi peran pemimpin nasional dalam pengembangan sumber daya manusia bidang pariwisata," *Dimensi*, vol. 6, no. 3, pp. 464-474, 2017.
- [4] S. Rizki, "Strategi Dinas Pariwisata Dan Kebudayaan Kota Batam Dalam Mengembangkan Kota Batam Sebagai Destinasi Wisata Mice (Meeting, Incentive, Conference And Exhibition) Tahun 2011-2014," *JOM FISIP*, vol. 3, no. 2, pp. 1-13, 2014.
- [5] A.L. Leal-Rodríguez, J.L. Roldán, J.A. Ariza-Montes, and A. Leal-Millán, "From potential absorptive capacity to innovation outcomes in project teams: The conditional mediating role of the realized absorptive capacity in a relational learning context," *Int. J. Proj. Manag.*, vol. xx, no. xx, 2014, doi: 10.1016/j.ijproman.2014.01.005.
- [6] R.M. Engelman, E.M. Fracasso, S. Schmidt, and A.C. Zen, "Intellectual capital, absorptive capacity, and product innovation," *Manag. Decis.*, vol. 55, no. 3, pp. 474-490, 2017, doi: 10.1108/MD-05-2016-0315.
- [7] A.H. Nazarpouri, "Survey the effects of intellectual capital and absorptive capacity on innovation capability (Case Study of Saipa Company in Tehran)," *Int. J. Innov. Manag.*, vol. 21, no. 2, pp. 1-19, 2017, doi: 10.1142/S1363919617500293.
- [8] A. Cassol, C.R. Gonçalo, and R.L. Ruas, "Redefining the relationship between intellectual capital and innovation: The mediating role of absorptive capacity," *Brazilian Adm. Rev.*, vol. 13, no. 4, pp. 1-25, 2016, doi: 10.1590/1807-7692bar2016150067.
- [9] W. Gunawan, P. Gerardus, B.J. Tji, and K. Richard, "The Use of Absorptive Capacity in Improving the New Product Development (NPD)," in *International Conference on Computing and Applied Informatics 2016, 2017*, pp. 1-10, doi: 10.1088/1742-6596/755/1/011001.
- [10] K. Mennens, A. Van Gils, G. Odekerken-Schröder, and W. Letterie, "Exploring antecedents of service innovation performance in manufacturing SMEs," *Int. Small Bus. J. Res. Entrep.*, vol. 00, no. 0, pp. 1-21, 2018, doi: 10.1177/0266242617749687.
- [11] BPS, "Kota Batam dalam Angka 2017," 2017.
- [12] S. Ayuni et al., "Laporan Perekonomian Indonesia 2017," 2017.
- [13] A.A. Saefuloh, "Kebijakan Ketenagakerjaan pada Sektor Industri di Kota Batam," *Kajian*, vol. 16, no. 1, pp. 189-217, 2011.
- [14] A. Mona, N. Rajneesh, and M.-N. Andrea, "How do collaboration and investments in knowledge management affect process innovation in services?" *J. Knowl. Manag.*, vol. 20, no. 5, pp. 1004-1024, 2016, doi: 10.1108/JKM-11-2015-0429.
- [15] W. Shan, C. Zhang, and J. Wang, "Internal social network, absorptive capacity, and innovation: Evidence from new ventures in China," *Sustain.*, vol. 10, no. 4, pp. 1-27, 2018, doi: 10.3390/su10041094.
- [16] C. Soo, A.W. Tian, S.T.T. Teo, and J. Cordery, "Intellectual Capital-Enhancing HR, Absorptive Capacity, and Innovation," *Hum. Resour.*

- Manage., vol. 56, no. 3, pp. 431–454, 2017, doi: DOI:10.1002/hrm.21783.
- [17] S. Ang et al., “Cultural Intelligence: Its Measurement and Effects on Cultural Judgment and Decision Making, Cultural Adaptation and Task Performance,” *Manag. Organ. Rev.*, vol. 3, no. 3, pp. 335–337, 2007, doi: 10.1111/j-1740-8784.2007.00082.X.
- [18] I. Gölgeci, J. Swiatowiec-Szczepanska, and K. Raczkowski, “How does cultural intelligence influence the relationships between potential and realized absorptive capacity and innovativeness? Evidence from Poland,” *Technol. Anal. Strateg. Manag.*, vol. 0, no. 0, pp. 1–15, 2016, doi: 10.1080/09537325.2016.1245858.
- [19] M.M. Omoush, “Impact of Intangible Assets (Intellectual Capital, Knowledge Management) on Innovation: A Study on Tourist Agencies in Jordan (Tourist Agencies in Irbid),” *Int. J. Bus. Manag.*, vol. 14, no. 6, p. 138, 2019, doi: 10.5539/ijbm.v14n6p138.
- [20] A. Kalkan, Ö.Ç. Bozkurt, and M. Arman, “The Impacts of Intellectual Capital, Innovation and Organizational Strategy on Firm Performance,” *Procedia - Soc. Behav. Sci.*, vol. 150, pp. 700–707, 2014, doi: 10.1016/j.sbspro.2014.09.025.
- [21] M. Maboudi, M.H. Mobaraki, and J. Khavandkar, “The Effect of Intellectual Capital on Innovation: A Case Study of an Institute for Advanced Studies in Basic Sciences Located in the Science and Technology Park of Zanjan,” *J. Entrep. Organ. Manag.*, vol. 04, no. 03, 2015, doi: 10.4172/2169-026x.1000148.
- [22] S. Cettin and Y. Fidan, “The Relationship Among Human Capital Absorptive Capacity and Innovation Performance,” *Bus. Manag. Stud. An Int. J.* vol. 5, no. 4, pp. 1–22, 2017, doi: 10.15295/bmij.v5i4.139 İNSAN.
- [23] P. Kittikunchotiwut, “The role of social capital on absorptive capacity and organizational innovation,” *J. Bus. Retail Manag. Res.*, no. October, pp. 27–40, 2015.
- [24] S.A. Zahra and G. George, “Absorptive Capacity: A Review Reconceptualization, and Extension,” *Acad. Manag.*, vol. 27, no. 2, pp. 185–203, 2002.
- [25] E. Limaj and E. Bernroider, “The roles of absorptive capacity and cultural balance for exploratory and exploitative innovation in SMEs,” *J. Bus. Res.* J., 2017, doi: 10.1016/j.jbusres.2017.10.052.
- [26] W.M. Cohen and D.A. Levinthal, “Absorptive Capacity: A New Perspective on and Innovation Learning,” *Adm. Sci. Q.*, vol. 35, no. 1, pp. 128–152, 1990.
- [27] G.A. Davila, S. Durst, and G. Varvakis, “Knowledge Absorptive Capacity, Innovation, and Firm’s Performance Performance: Insights From The South of Brazil,” *Int. J. Innov. Manag.*, vol. 22, no. 2, pp. 1–34, 2018, doi: 10.1142/S1363919618500135.
- [28] S. Ang and A.C. Inkpen, “Cultural Intelligence and Offshore Outsourcing Success: A Framework of Firm-Level Intercultural Capability,” *Decis. Sci.*, vol. 39, no. 3, pp. 337–358, 2008.
- [29] A. Tan, “The Effect of Social Capital and Absorptive Capacity through Knowledge Management on Finance Company Performance in Indonesia,” *Int. Bus. Res.*, vol. 11, no. 1, pp. 87–101, 2018, doi: 10.5539/ibr.v11n1p87.
- [30] R.V. Costa, C. F.J. Fernandez, and F.P. Dorrego, “Critical elements for product innovation at Portuguese innovative SMEs: an intellectual capital perspective,” *Knowl. Manag. Res. Pract.*, vol. 12, no. 3, pp. 322–338, 2014, doi: 10.1057/kmrp.2014.15.
- [31] I. Ghozali and H. Latan, *Partial Least Squares: Konsep, Teknik dan Aplikasi Menggunakan program SmartPLS 3.0*. Badan Penerbit Universitas Diponegoro Semarang, 2013.
- [32] S.I. Santoso, Y. Djaelani, and Destryanti, “Pengaruh Intellectual Capital Terhadap Pertumbuhan, Nilai Pasar, Produktivitas Dan Profitabilitas,” *J. Ilm. Akunt. Perad.*, vol. Vol. III, no. 2, pp. 85–113, 2017.
- [33] G. Albort-Morant, J. Henseler, G. Cepeda-Carrion, and A.L. Leal-Rodriguez, “Potential and Realized Absorptive Capacity as Complementary Drivers of Green Product and Process Innovation Performance,” *Sustainability*, vol. 10, no. 381, pp. 1–20, 2018, doi: 10.3390/su10020381.
- [34] F. Khan, Z. Xuehe, F. Atlas, K.U. Khan, A. Pitafi, and M.U. Saleem, “Impact of absorptive capacity and dominant logic on innovation performance of public sector organizations in Hefei (Anhui Province), China,” *Manag. Sci. Lett.*, vol. 7, no. 6, pp. 275–284, 2017, doi: 10.5267/j.msl.2017.3.004.
- [35] T.H. Nam, N.P. Tuan, and N.Van Minh, “Critical Successful Factors for Innovation in Vietnamese Firms,” *J. Ind. Eng. Manag.*, vol. 10, no. 3, pp. 522–544, 2017.